Exam guidelines

Prepare your personal AWS account just in case.

Answer the questions based on how you understand the question. Most students do that. But some students ask questions something like am I doing it correctly, how do I resolve the error, microphone is not working, etc.

I will be happy to answer if the question has an error.

Some students start asking for clarifications without reading the question carefully. Understanding the question itself is 50% of the solution. For example, in the question, I clearly mentioned the question "confirm email subscription on the AWS console". But then some students ask, can I use email to confirm.

The exam covers slides, labs, and what I explained in class. Extra tasks are excluded from the hands-on.

Exam policy:

- It is a closed-book exam. No personal note. No googling or no other websites. I allow what you can do explicitly in the question. Close all other apps and browser tabs during the hands-on part.
- Set your phone to airplane mode and put it in your backpack or bring it to the front table. Backpacks are in front of the board.

Exam format:

- 2-hour exam. Starts at 10:00 am and ends around 12:10 pm. Come to do class at 9:50 am and settle down.
    - Theory part on paper for 60 minutes (Paper-based). 40 points.
        - 10 true/false questions (15 minutes) – 10 points. Each question has 1 point.
        - 5 open-ended questions (15 minutes) – 10 points. Each question has 2 points.
        - 20 multiple-choice questions (30 minutes) – 20 points. Each question has 1 point. Choose only one out of 4 options.
        - Leave the classroom once finished the theory part so other students in progress can stay focused.
        - Come into the classroom at 10:50 am again, to turn on your laptop and login to AWS Academy and Sakai. According to previous records, one third of students finish the exam in 40 minutes, half students finish it in 50 minutes.
    - Hands-on part for 60 minutes (Computer-based). Your screen is recorded. Points vary between 15 and 20.
        - Reset the lab before exam and delete SGs.
        - While doing the hands-on, it is okay to upload an image to an S3 bucket or confirm a notification via email if it requires you to complete or test what you did.

- You don’t need to memorize anything. The test is for checking your understanding. All required scripts are given. But still, at least, you need to replace some values like ARN, URL.
- Use your own laptop. You need to take the proctor track on Sakai and install the required software and prepare your laptop for the exam. Those who have Linux, install OBS Project.

Important:

After the exam, don’t log in to your AWS Academy account until I finished grading. I can know when you last used AWS academy. If you do so, that means you logged in after the exam and made changes and you will get 0 points on the hands-on part.

Proctoring:

- Don’t forget to begin the assignment on Sakai. So it starts counting down the timer. Then you can go to AWS Academy.
- Once you are done, end the AWS Academy lab. Submit the test on Sakai. End the proctoring.

You will receive NC If you are caught cheating or trying to take a picture of the exam or using software websites that are not allowed.

Things to do on your side:

- Take the mock exam in Proctortrack which will set up your laptop for the real exam.
- Reset the Lab

Tips

- Don’t neglect configuration. Some students just create resources and leave. Those miss configuration points.
- In open-ended questions, keep your answer short and precise. Don’t spend much time on that.
- Start AWS Academy Lab before starting the proctor track exam on Sakai.
- Make sure you can do tasks like your labs without following the step-by-step instructions.
- If I didn’t explicitly specify, don’t touch that field.
- Read all lectures thoroughly and understand the main concepts in the slide.
- Section 1 of the theory – Read questions carefully.
- Section 2 of the theory – Keep answers short and concise.

Main Topics

Lesson 1 – Intro

Different cloud models

- IaaS
- PaaS
- CaaS
- FaaS

Lesson 2 – EC2 and IAM

- Global infrastructure (Region, AZ, Edge Servers)
- VPC and its security layer NACL and SG
- EC2 and its components (EBS, EFS)
- IAM
    - Role vs User
    - Temporary tokens and STS
    - IAM policies
    - Conditionals
    - Federated users

Lesson 3 – S3

Main features are:

- Signed URL
- VPC endpoint
- Hosting website with CloudFront
- Storage classes
- Event notification
- Global replication

Lesson 4 – ALB and ASG

ALB

- Listener
- TG

NLB

- No SG
- TCP and more performant

ASG

- Desired number vs current number
- CloudWatch alarm for scaling
- Scaling policies (target scaling)

Lesson 5 – RDS

RDS (Relational Database Service) helps you with

- High-availability and failover (multi-AZ deployment)
    - Creates a standby instance if it is non-Aurora
    - Creates a read-replica if it is Aurora
- Scaling - It allows you to have some "read-replicas"
- Backup – Daily backup, snapshots.

There are 2 types of RDS. Based on the type, features are various.

1. General (MySQL, Oracle, MsSQL, MariaDB, Postgre)
2. Aurora - a relational database created by AWS on top of MySQL and Postgre.

Parameter group – How you configure your database.

Lesson 6 – ECS

Understand how to deploy containerized (docker) applications in AWS ECS and its main components.

- ECR – This is where you upload the docker image from your laptop (server) to AWS. You need an IAM user (tokens) that has permission to push image.
- ECS
    - Cluster – Can be serverless (Fargate) or on EC2 (on servers).
    - Service – Your application. Scaling, ALB, networking are configured here.
    - Task – The actual resource running your docker app.
    - Task definition – The definition to launch tasks includes image URI and task size.
- AppRunner – Even higher-level abstraction that you only manage your web app. The underlying resources, CICD are done by AWS.
- CloudWatch Insights.
- Common AWS services.

Previous exam

True/False questions

1. Target tracking scaling policy scales out when the specified metric is above the target value whereas step scaling policy scales based on one or more alarm breaches.
2. Is a NAT gateway used to connect a VPC to the internet?
3. IAM is a global service.
4. You created Load Balancer instances in us-east-1d and us-east-1b AZs. Can the ALB route traffic to an instance in us-east-1c AZ?
5. You are charged when you are using an Elastic IP.
6. An IAM role generates tokens. You can SSH into an EC2 instance with those tokens.
7. Latency-based routing policy in Route 53 routes requests to the closest country to ensure the lowest latency.
8. By default, EBS root volumes are deleted when terminating an instance.
9. Can we create MongoDB in RDS?
10. NACL rules are evaluated from highest to lowest based on rule number.

Multiple choice questions

1. What is the cloud we learned?
    a. A white collection of water vapor in the sky.
    b. A collection of services including blockchain, AI, VR, etc.
    c. Storage where you can store your data and it's always available.
    d. B and C.
2. You get hired at a startup as a software engineer. Your company uses data storage for storing images, videos etc. That storage costs a lot. Your company is looking for ways to reduce cost by utilizing services in the AWS cloud. What service would recommend?
    a. EBS
    b. EFS
    c. RDS
    d. S3
3. Which model of cloud services is best for building event-driven applications?
    a. IaaS
    b. FaaS
    c. SaaS
    d. PaaS
4. How do you deploy a global application on AWS?
    a. Use only global services
    b. Deploy to each region
    c. Use global replication features like S3 global replication
    d. Use backups and recover them in other regions
5. Which component of an ALB routes requests to one or more registered targets?
    a. ALB listener
    b. Target Groups
    c. ALB listener rules
    d. None
6. You want to maintain the CPU utilization of EC2 instances in ASG at 70%. What scaling policy works best in this case?
    a. Target Tracking
    b. Step Scaling
    c. Scheduled Scaling
    d. Predictive scaling
7. Assume you have different work files in your company that needs to be accessed differently. Some of the files are accessed daily, some frequently and some will probably have never got accessed. As a developer and AWS expert, what is your solution to meet the usage needs and minimize storage cost?
    a. Destroy the never accessed files
    b. Create S3 Object lifecycle rule
    c. Zipped the files to safe space
    d. All
8. Which do we not attach a IAM Policy to?
    a. service

    b. role
    c. user
    d. groups
9. What is included in the types of permissions used for S3 service?
    a. Identity-based
    b. Resource-based
    c. Access Control List
    d. all of the above
10. Which DB engine delivers the most throughput?
    a. PostgreSQL
    b. Amazon Aurora
    c. MySQL
    d. MariaDB
11. One of the following is not correct about Simple Queue Service?
    a. SQS provides approximately unlimited scalability like SNS.
    b. For message size above 256 kb, we can store it in s3 then send the key as a message to the queue.
    c. SQS automatically deletes messages from queue one consumer start process
    d. We can store the message in the queue for up to 14 days.
12. ABC company uses AWS S3 services. You are working as a software developer in the company. Your immediate supervisor asked you to give the suggestion, where to implement the object lifecycle class police that helps to minimize the storage cost. Which one of the following is not the level to apply the policies?
    a. All bucket levels in the storage
    b. One specific object in the bucket level
    c. One specific folder in the bucket level.
    d. Key level
13. You have an app developed for react project. This app works with the S3 buckets in the US East region. The app is hosted on an EC2 instance. Which of the following should ideally be used to ensure that the EC2 instance has the appropriate access to the S3 buckets?
    a. Users
    b. Groups
    c. IAM Roles
    d. IAM Policies
14. The current MSD students of MIU are planning to host a development environment on the cloud. This consists of EC2 and RDS instances. This environment will probably only be required for 3 months. Which options of EC2 instances would you use for this purpose?
    a. On-Demand
    b. Reserved
    c. Spot
    d. a and b
15. Which model of cloud service is said to be serverless?
    a. SaaS
    b. FaaS

    c. Paas
    d. IaaS
16. A Solutions Architect is developing a document sharing application and needs a storage layer. The storage should provide automatic support for versioning so that users can easily roll back to a previous version or recover a deleted account. Which AWS service will meet the above requirements?
    a. Amazon EBS
    b. Amazon S3
    c. Amazon EFS
    d. Amazon RDS
17. You have an application in which users subscribe to a service using their email ID. They should be able to receive messages published by the service and this needs to be done using AWS Components. Which of the below would be a probable service included in this architecture?
    a. AWS SNS
    b. AWS SQS
    c. AWS S3
    d. AWS CloudWatch
18. Which of the following is true about key-pairs?
    a. Private key is used to encrypt the information while at the receiver's side.
    b. Public key is used to decrypt the information.
    c. Key-pairs allows you to access the instances securely
    d. All of the above correct
19. You'd like to process failed messages. What queue do you need?
    a. SQS standard queue
    b. SQS dead letter queue
    c. SQS delay queue
    d. SQS FIFO queue
20. To make our front-end application hosted on S3 available to the world, we must provide public access to:
    a. Bucket
    b. Object
    c. Key
    d. A and B
    e. All

Hands-on

Task 1 - Create an ALB.

1. Create a SG for the ALB that allows access from the internet.
2. ALB nodes will be in us-east-1a and us-east-1b for HA.
3. Create a listener and a target group. You will run instances created by ASG in the TG. For now, register no instance.
4. Add tags
    a. Key is MidtermExam (no value here)
    b. Key is Name. It is value is your full name.

Task 2 - Create an ASG that sends notifications when scales in or out.

1. Create a SG that allows access from only the ALB.
2. Create a launch configuration using Amazon Linux 2 AMI.
3. Instances will be web servers that show “Midterm exam – Your Name” in the <p> tag.
4. Create a ASG based on the launch configuration created above. Make sure instances created in the private subnets.
5. Attach instances to the ALB.
6. Setup auto scaling policy. The policy maintains the CPU utilization at 30%.
7. Add notification that sends email to you when the ASG launches or terminates instances.